STATE OF MISSOURI

# DEPARTMENT OF NATURAL RESOURCES

MISSOURI CLEAN WATER COMMISSION

# MISSOURI STATE OPERATING PERMIT

In compliance with the Missouri Clean Water Law, (Chapter 644 R.S. Mo. as amended, hereinafter, the Law), and the Federal Water Pollution Control Act (Public Law 92-500, 92nd Congress) as amended,

| | |
|---|---|
| Permit No. | MO-0094161 |
| Owner: | City of Waynesville |
| Address: | 201 North Street, Waynesville, MO 65583 |
| Continuing Authority: | Same as above |
| Address: | Same as above |
| Facility Name: | Waynesville Wastewater Treatment Facility |
| Facility Address: | 405 Pine Street, Waynesville, MO 65583 |
| Legal Description: | SW ¼, NE ¼, Sec. 24, T36N, R12W, Pulaski County |
| Latitude/Longitude: | See page 2 |
| Receiving Stream: | Roubidoux Creek (P) |
| First Classified Stream and ID: | Roubidoux Creek (P)(01512) |
| USGS Basin & Sub-watershed No.: | (10290201-060005) |

is authorized to discharge from the facility described herein, in accordance with the effluent limitations and monitoring requirements as set forth herein:

**FACILITY DESCRIPTION:**

See page 2

This permit authorizes only wastewater discharges under the Missouri Clean Water Law and the National Pollutant Discharge Elimination System; it does not apply to other regulated areas. This permit may be appealed in accordance with Section 644.051.6 of the Law.

March 22, 2002
Effective Date

Stephen M. Mahfood, Director, Department of Natural Resources
Executive Secretary, Clean Water Commission

March 21, 2007
Expiration Date

Interim Director of Staff, Clean Water Commission

FACILITY DESCRIPTION (continued)

Outfall #001 – Municipal – SIC #4952
Oxidation ditch/seasonal chlorination/dechlorination/sludge is being land applied.
Design population equivalent is 12,500.
Design flow is 1,250,000 gallons per day.
Actual flow is 383,000 gallons per day.
Design sludge production is 250 dry tons/year.
Latitude/Longitude: +3750072/-09211485.

Outfall #002 – Infiltration/Inflow basin – SIC #4952
Design flow is 200,000 gallons/day.
Actual flow is dependent upon rainfall.
Latitude/Longitude: +3750065/-09211518.

Outfall #003 – Municipal – SIC #4952
Storm water/plant grounds
Design flow is 325,000 gallons/day.
Actual flow is dependent upon rainfall.
Latitude/Longitude: +3750069/-09211503.

## A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS

PERMIT NUMBER MO-0094161

The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

| OUTFALL NUMBER AND EFFLUENT PARAMETER(S) | UNITS | FINAL EFFLUENT LIMITATIONS | | | MONITORING REQUIREMENTS | |
|---|---|---|---|---|---|---|
| | | DAILY MAXIMUM | WEEKLY AVERAGE | MONTHLY AVERAGE | MEASUREMENT FREQUENCY | SAMPLE TYPE |
| Outfall #001 | | | | | | |
| Flow | MGD | * | | * | once/weekday***** | 24 hr. total |
| Biochemical Oxygen Demand$_5$** | | | | | | |
| (June 1 – September 30) | mg/L | | 15 | 10 | once/week | 24 hr. comp. |
| (October 1 – May 31) | mg/L | | 20 | 15 | once/week | 24 hr. comp. |
| Total Suspended Solids** | mg/L | | 45 | 30 | once/week | 24 hr. comp. |
| pH – Units | SU | *** | | *** | once/week | grab |
| Ammonia as N | mg/L | 1.85 | | 1.0 | once/week | grab |
| Chlorine, Total Residual (Note 2) | mg/L | <0.01 | | <0.01 | once/week | grab |
| Fecal Coliform (Note 1) | #/100mL | 1000 | | 400 | once/week | grab |
| Instream Monitoring**** – above Outfall #001 and ¼ mile below Outfall #001 | | | | | | |
| Ammonia | mg/L | * | | * | once/week | grab |
| pH – Units | SU | * | | * | once/week | grab |
| Temperature | °F | * | | * | once/week | grab |
| Dissolved Oxygen | mg/L | * | | * | once/week | grab |

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE May 28, 2002.

| | | | | |
|---|---|---|---|---|
| Whole Effluent Toxicity (WET) Test | % survival | | See Special Conditions | once/year in July | 24 hr. composite |

MONITORING REPORTS SHALL BE SUBMITTED ANNUALLY; THE FIRST REPORT IS DUE October 28, 2002. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

## B. STANDARD CONDITIONS

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Parts I, II & III STANDARD CONDITIONS DATED October 1, 1980 and August 15, 1994, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.

## A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS



The permittee is authorized to discharge from outfall(s) with serial number(s) as specified in the application for this permit. The final effluent limitations shall become effective upon issuance and remain in effect until expiration of the permit. Such discharges shall be controlled, limited and monitored by the permittee as specified below:

| OUTFALL NUMBER AND EFFLUENT PARAMETER(S) | UNITS | FINAL EFFLUENT LIMITATIONS | | | MONITORING REQUIREMENTS | |
|---|---|---|---|---|---|---|
| | | DAILY MAXIMUM | WEEKLY AVERAGE | MONTHLY AVERAGE | MEASUREMENT FREQUENCY | SAMPLE TYPE |
| Outfall #002 | | | | | | |
| Flow | MGD | * | | * | once/weekday***** | 24 hr. total |
| Biochemical Oxygen Demand$_5$** | mg/L | | 45 | | once/month | grab |
| Total Suspended Solids** | mg/L | | 45 | | once/month | grab |
| pH – Units | SU | *** | | *** | once/month | grab |
| Outfall #003 | | | | | | |
| Flow | MGD | * | | * | once/weekday***** | grab |
| Biochemical Oxygen Demand | mg/L | | 45 | | once/month | grab |
| Total Suspended Solids | mg/L | | 45 | | once/month | grab |
| pH - Units | SU | *** | | *** | once/month | grab |

MONITORING REPORTS SHALL BE SUBMITTED MONTHLY; THE FIRST REPORT IS DUE May 28, 2002. THERE SHALL BE NO DISCHARGE OF FLOATING SOLIDS OR VISIBLE FOAM IN OTHER THAN TRACE AMOUNTS.

## B. STANDARD CONDITIONS

IN ADDITION TO SPECIFIED CONDITIONS STATED HEREIN, THIS PERMIT IS SUBJECT TO THE ATTACHED Parts I, II & III STANDARD CONDITIONS DATED October 1, 1980 and August 15, 1994, AND HEREBY INCORPORATED AS THOUGH FULLY SET FORTH HEREIN.



A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

* Monitoring requirement only.
** This facility is required to meet a removal efficiency of 85% or more.
*** pH is measured in pH units and is not to be averaged. The pH is limited to the range of 6.5-9.0 pH units.
**** Monitoring should be performed when stream is not affected by storm water runoff. The stream flow should be estimated when the sample is taken, and reported to the Department of Natural Resources.
***** Once each weekday means: Monday, Tuesday, Wednesday, Thursday, and Friday.

Note 1 – Final limitations and monitoring requirements for Fecal Coliform are applicable only during the recreational season from April 1 through October 31.

Note 2 - This permit contains a Total Residual Chlorine (TRC) limit.

a. If the TRC limit in this permit is 0.01 mg/L or 0.2 mg/L, you must use an analytical method that has a quantification limit of no greater than 0.05 mg/L TRC. For reporting purposes on the discharge monitoring report (DMR), all analytical values below 0.05 mg/L shall be reported as "<quantlim." All analytical values at or above the quantification limit of 0.05 mg/L shall be reported as the measured value. The permittee shall report the quantification limit in the remarks section of the DMR.

The average monthly effluent values for TRC will be determined by assuming that analytical results below the quantification limit are equivalent to 0 mg/L when calculating the monthly average.

The daily effluent value will be considered equal to 0 mg/L if it is below the quantification limit.

A. EFFLUENT LIMITATIONS AND MONITORING REQUIREMENTS (continued)

Note 2 - Total Residual Chlorine (TRC) (continued)

b. If the TRC limit in this permit is 1.0 mg/L; you must use an analytical method with a quantification limit between 0.2 and 0.5 mg/L. All analytical values below the quantification limit shall be reported as "<quantlim." All analytical values at or above the quantification limit shall be reported as the measured value.

The average monthly effluent values for TRC will be determined by assuming that analytical results below the quantification limit are equivalent to 0 mg/L when calculating the monthly average.

The daily effluent value will be considered equal to 0 mg/L if it is below the quantification limit.

c. Disinfection is required year-round unless the permit specifically states that "Final limitations and monitoring requirements for Fecal Coliform are applicable only during the recreational season from April 1 through October 31." If your permit does not require disinfection during the non-recreational months, do not chlorinate in those months.

d. Do not chemically dechlorinate if it is not needed to meet the limits in your permit.

e. If no chlorine was used in a given sampling period, an actual analysis is not necessary. Simply report as "0 mg/L" TRC.

C. SPECIAL CONDITIONS

1. This permit may be reopened and modified, or alternatively revoked and reissued, to:
   (a) Comply with any applicable effluent standard or limitation issued or approved under Sections 301(b)(2)(C) and (D), 304(b)(2), and 307(a) (2) of the Clean Water Act, if the effluent standard or limitation so issued or approved:
      (1) contains different conditions or is otherwise more stringent than any effluent limitation in the permit; or
      (2) controls any pollutant not limited in the permit.
   (b) Incorporate new or modified effluent limitations or other conditions, if the result of a waste load allocation study, toxicity test or other information indicates changes are necessary to assure compliance with Missouri's Water Quality Standards.
   (c) Incorporate new or modified effluent limitations or other conditions if, as the result of a watershed analysis, a Total Maximum Daily Load (TMDL) limitation is developed for the receiving waters which are currently included in Missouri's list of waters of the state not fully achieving the state's water quality standards, also called the 303(d) list.

   The permit as modified or reissued under this paragraph shall also contain any other requirements of the Clean Water Act then applicable.

2. All outfalls must be clearly marked in the field.

3. Permittee will cease discharge by connection to areawide wastewater treatment system within 90 days of notice of its availability.

C. SPECIAL CONDITIONS (continued)

4. Changes in Discharges of Toxic Substances

The permittee shall notify the Director as soon as it knows or has reason to believe:

(a) That any activity has occurred or will occur which would result in the discharge of any toxic pollutant which is not limited in the permit, if that discharge will exceed the highest of the following "notification levels:"
    (1) One hundred micrograms per liter (100 µg/L);
    (2) Two hundred micrograms per liter (200 µg/L) for acrolein and acrylonitrile; five hundred micrograms per liter (500 µg/L) for 2,5 dinitrophenol and for 2-methyl-4, 6-dinitrophenol; and one milligram per liter (1 mg/L) for antimony;
    (3) Five (5) times the maximum concentration value reported for the pollutant in the permit application;
    (4) The level established in Part A of the permit by the Director.

(b) That they have begun or expect to begin to use or manufacture as an intermediate or final product or byproduct any toxic pollutant, which was not reported in the permit application.

5. Report as no-discharge when a discharge does not occur during the report period.

6. General Criteria. The following water quality criteria shall be applicable to all waters of the state at all times including mixing zones. No water contaminant, by itself or in combination with other substances, shall prevent the waters of the state from meeting the following conditions:

(a) Waters shall be free from substances in sufficient amounts to cause the formation of putrescent, unsightly or harmful bottom deposits or prevent full maintenance of beneficial uses;
(b) Waters shall be free from oil, scum and floating debris in sufficient amounts to be unsightly or prevent full maintenance of beneficial uses;
(c) Waters shall be free from substances in sufficient amounts to cause unsightly color or turbidity, offensive odor or prevent full maintenance of beneficial uses;
(d) Waters shall be free from substances or conditions in sufficient amounts to result in toxicity to human, animal or aquatic life;
(e) There shall be no significant human health hazard from incidental contact with the water;
(f) There shall be no acute toxicity to livestock or wildlife watering;
(g) Waters shall be free from physical, chemical or hydrologic changes that would impair the natural biological community;
(h) Waters shall be free from used tires, car bodies, appliances, demolition debris, used vehicles or equipment and solid waste as defined in Missouri's Solid Waste Law, section 260.200, RSMo, except as the use of such materials is specifically permitted pursuant to section 260.200-260.247.

7. Sludge and Biosolids Use For Domestic Wastewater Treatment Facilities

(a) Permittee shall comply with the pollutant limitations, monitoring, reporting, and other requirements in accordance with the attached permit Standard Conditions.
(b) If sludge is not removed by a contract hauler, permittee is authorized to land apply biosolids that are removed from the domestic wastewater treatment lagoon during lagoon clean-out and maintenance activities. Permit Standard Conditions, Part III shall apply to the land application of biosolids. Permittee shall notify the department at least 180 days prior to the planned removal of biosolids from the lagoon. The department may require submittal of a biosolids management plan for department review and approval as determined appropriate on a case-by-case basis.

C. SPECIAL CONDITIONS (continued)

8. Whole Effluent Toxicity (WET) tests shall be conducted as follows:

| SUMMARY OF WET TESTING FOR THIS PERMIT | | | | |
|---|---|---|---|---|
| OUTFALL | A.E.C. % | FREQUENCY | SAMPLE TYPE | MONTH |
| 001 | 100% | Annually | 24 hr. comp. | July |

a. Test Schedule and Follow-Up Requirements

(1) Perform a single-dilution test in the months and at the frequency specified above.

If the effluent passes the test, do not repeat the test until the next test period. Submit results with the annual report.
If the effluent fails the test, a multiple dilution test shall be performed within 30 days, and biweekly thereafter, until one of the following conditions are met:

(a) THREE CONSECUTIVE MULTIPLE-DILUTION TESTS PASS. No further tests need to be performed until next regularly scheduled test period.
(b) A TOTAL OF THREE MULTIPLE-DILUTION TESTS FAIL.

(2) The permittee shall submit a summary of all test results for the test series to the WPCP, Planning Section, P.O. Box 176, Jefferson City, MO 65102 within 14 days of the third failed test. DNR will contact the permittee with initial guidance on conducting a toxicity identification evaluation (TIE) or toxicity reduction evaluation (TRE). The permittee shall submit a plan for conducting a TIE or TRE to the Planning Section of the WPCP within 60 days of the date of DNR's letter. This plan must be approved by DNR before the TIE or TRE is begun. A schedule for completing the TIE or TRE shall be established in the plan approval.

(3) Upon DNR's approval, the TIE/TRE schedule may be modified if toxicity is intermittent during the TIE/TRE investigations. A revised WET test schedule may be established by DNR for this period.

(4) If a previously completed TIE has clearly identified the cause of toxicity, additional TIEs will not be required as long as effluent characteristics remain essentially unchanged and the permittee is proceeding according to a DNR approved schedule to complete a TRE and reduce toxicity. Regularly scheduled WET testing as required in the permit, without the follow-up requirements, will be required during this period.

(5) In addition to the WET test summary report required in part (2), all failing test results shall be reported to DNR within 14 days of the availability of the results.

(6) All WET test results for the reporting period shall be summarized and submitted to DNR by the end of the following October. When WET test sampling is required to run over one DMR period, each DMR report shall contain information generated during the reporting period.

C. SPECIAL CONDITIONS (continued)

8. Whole Effluent Toxicity (WET) (continued)

b. PASS/FAIL procedure and effluent limitations

(1) To pass a single-dilution test, mortality observed in the AEC test concentration shall not be significantly different (at the 95% confidence level; p = 0.05) than that observed in the upstream receiving-water control sample. The appropriate statistical tests of significance will be those outlined in the most current USEPA acute toxicity manual or those specified by the MDNR.

(2) To pass a multiple-dilution test:

(a) the computed percent effluent at the edge of the zone of initial dilution, Acceptable Effluent Concentration (AEC), must be less than three-tenths (0.3) of the $LC_{50}$ concentration for the most sensitive of the test organisms; or,
(b) all dilutions equal to or greater than the AEC must be nontoxic. Failure of one multiple-dilution test is an effluent limit violation.

c. Test Conditions

(1) Test species: Ceriodaphnia dubia and Pimephales promelas (fathead minnow). Organisms used in WET testing should come from cultures reared for the purpose of conducting toxicity tests and should be cultured in a manner consistent with the most current USEPA guidelines. All test animals should be cultured as described in EPA-600/4-90/027.

(2) Test period: 48 hours at the "Acceptable Effluent Concentration" (AEC) specified above.

(3) When dilutions are required, upstream receiving stream water shall be used as dilution water. If upstream water is unavailable or if mortality in the upstream water exceeds 10%, "reconstituted" water will be used as dilution water. Procedures for generating reconstituted water will be supplied by the MDNR upon request.

(4) Tests should be initiated immediately after the sample is collected, but tests must be initiated no later than 36 hours after sample collection.

(5) Single-dilution tests will be run with:

(a) Effluent at the AEC concentration;
(b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and
(c) reconstituted water.

(6) Multiple-dilution tests will be run with:

(a) 100%, 50%, 25%, 12.5%, and 6.25% effluent, unless the AEC is less than 25% effluent, in which case dilutions will be 4 times the AEC, two times the AEC, AEC, 1/2 AEC and 1/4 AEC;
(b) 100% receiving-stream water (if available), collected upstream of the outfall at a point beyond any influence of the effluent; and
(c) reconstituted water.

(7) If reconstituted-water control mortality for a test species exceeds 10%, the entire test will be rerun.

**SUMMARY OF TEST METHODOLOGY FOR WHOLE-EFFLUENT TOXICITY TESTS**

Whole-effluent-toxicity test required in NPDES permits shall use the following test conditions when performing single or multiple dilution methods. Any future changes in methodology will be supplied to the permittee by the Missouri Department of Natural Resources (MDNR). Unless otherwise specified by MDNR, procedures should be consistent with Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater and Marine Organisms, EPA/600/4-90/027.

Test conditions for Ceriodaphnia dubia:

| | |
|---|---|
| Test duration: | 48 h |
| Temperature: | 25 ± 2°C |
| Light Quality: | Ambient laboratory illumination |
| Photoperiod: | 16 h light, 8 h dark |
| Size of test vessel: | 30 mL (minimum) |
| Volume of test solution: | 15 mL (minimum) |
| Age of test organisms: | <24 h old |
| No. of animals/test vessel: | 5 |
| No. of replicates/concentration: | 4 |
| No. of organisms/concentration: | 20 (minimum) |
| Feeding regime: | None (feed prior to test) |
| Aeration: | None |
| Dilution water: | Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness. |
| Endpoint: | Mortality (Statistically significant difference from upstream receiving water control at $p \leq 0.05$) |
| Test acceptability criterion: | 90% or greater survival in controls |

Test conditions for (Pimephales promelas):

| | |
|---|---|
| Test duration: | 48 h |
| Temperature: | 25 ± 2°C |
| Light Quality: | Ambient laboratory illumination |
| Photoperiod: | 16 h light/ 8 h dark |
| Size of test vessel: | 250 mL (minimum) |
| Volume of test solution: | 200 mL (minimum) |
| Age of test organisms: | 1-14 days (all same age) |
| No. of animals/test vessel: | 10 |
| No. of replicates/concentration: | 4 (minimum) single dilution method<br>2 (minimum) multiple dilution method |
| No. of organisms/concentration: | 40 (minimum) single dilution method<br>20 (minimum) multiple dilution method |
| Feeding regime: | None (feed prior to test) |
| Aeration: | None, unless DO concentration falls below 4.0 mg/L; rate should not exceed 100 bubbles/min. |
| Dilution water: | Upstream receiving water; if no upstream flow, synthetic water modified to reflect effluent hardness. |
| Endpoint: | Mortality (Statistically significant difference from upstream receiving water control at $p \leq 0.05$) |
| Test Acceptability criterion: | 90% or greater survival in controls |

Date of Public Notice: February 1, 2002

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT
FACT SHEET

This Fact Sheet explains the applicable regulations, rationale for development of this permit and the public participation process.

NPDES PERMIT NUMBER: MO-0094161

FACILITY NAME: Waynesville WWTF

OWNER NAME: City of Waynesville

LOCATION: Sec. 24, T36N, R12W, Pulaski County

RECEIVING STREAM: Roubidoux Creek

FACILITY CONTACT PERSON: Tom Tinsley TELEPHONE: (573) 774-6171

FACILITY DESCRIPTION AND RATIONALE

Outfall #001
Oxidation Ditch activated sludge plant with chlorination & dechlorination. Sludge is land applied.
Design Flow is 1,250,000 gallons per day.
Actual average flow is 383,000 gallons per day.
Design Sludge Production is 250 dry tons per year.

Outfall #002
Infiltration/Inflow Basin

Outfall #003
Storm Water From Plant Grounds

See attached Water Quality Review Sheet for rationale.

This permit will be issued for a period of five

# WATER QUALITY REVIEW SHEET

## Facility Information

FACILITY NAME: Waynesville Wastewater Facility NPDES/SOP #: MO-0094161

FACILITY TYPE/DESCRIPTION: Oxidation ditch/chlorination/de-chlorination/sludge land applied.

ECOREGION: Ozark Highlands (Central Irregular Plains; Mississippi Alluvial Plains) 8- DIGIT HUC: 10290201 (Osage Plains; Ozark Highlands) COUNTY: Pulaski

LEGAL DESCRIPTION: SW ¼, NE ¼, Sec. 24, T36N, R12W LATITUDE/LONGITUDE: 3750083/-9211490

WATER QUALITY HISTORY: Facility has remained in compliance. WET tests have had 0% mortality in 100% effluent.

## Outfall Characteristics

| OUTFALL | DESIGN FLOW (CFS) | TREATMENT TYPE | RECEIVING STREAM | STREAM CLASS |
|---|---|---|---|---|
| 001 | 1.934 | Oxidation/activated sludge | Roubidoux Creek | P |
| 002 | 0.309 | I&I Basin | Roubidoux Creek | P |
| 003 | 0.503 | Stormwater from plant grounds | Roubidoux Creek | P |

### Receiving Waterbody Information

| RECEIVING STREAM | CLASS | 7Q10(CFS) | *DESIGNATED USES | OTHER CHARACTERISTICS |
|---|---|---|---|---|
| Roubidoux Creek | P | 3 | LWW, CDF, BTG, WBC | |

*Cool Water Fishery (CLF), Cold Water Fishery (CDF), Irrigation (IRR), Industrial (IND), Boating & Canoeing (BTG), Drinking Water Supply (DWS), Whole Body Contact Recreation (WBC), Protection of Warmwater Aquatic Life and Human Health (AQL), Livestock & Wildlife Watering (LWW)

Outfall is approx. 1.75 miles upstream from mouth of Roubidoux Creek, where it enters Gasconade River, and approximately 1 mile downstream from Roubidoux Spring.

## Permit Limits And Information

TMDL WATERSHED: (Y OR N) [Y] W.L.A. STUDY CONDUCTED: (Y OR N) [N] DISINFECTION REQUIRED: (Y OR N) [Y] DISINFECTION WAIVER: (Y OR N) [N]

| OUTFALL | EFFLUENT PARAMETER | DAILY MAX/MIN | WEEKLY AVERAGE | MONTHLY AVERAGE | COMMENTS |
|---|---|---|---|---|---|
| 1,2,3 | Flow | | | | Monitoring Requirement only, once/weekday, 24 hr total |
| 1 | Biochemical Oxygen Demand (mg/l) June 1 – Sept 30 | | 15 | 10 | Once/week |
| 1 | Biochemical Oxygen Demand (mg/l) Oct 1 – May 31 | | 20 | 15 | Once/week |
| 1 | Total Suspended Solids (mg/l) | | 45 | 30 | Once/week |
| 1 | pH (units) | | | | 6.5-9; Once/week |
| 1 | $NH_3$-N (mg/l) | 1.85 | | 1.0 | Once/week |
| 1 | Fecal Coliform | 1000 | | 400 | Once/week |
| 1 | TR Cl | <0.01 | | <0.01 | Once/week; Must be under detection limit |
| 2 & 3 | Biochemical Oxygen Demand (mg/l) | | 45 | | Once/month |
| 2 & 3 | Total Suspended Solids (mg/l) | | 45 | | Once/month |
| 2 & 3 | pH(units) | | | | 6.5-9; Once/month |

WET TEST (Y OR N): [Y] FREQUENCY: ANNUALLY A.E.C. 100% LIMIT: INSIGNIFICANT MORTALITY

## Receiving Water Monitoring Requirements

| Sample Location | Parameter | Sampling Frequency | Location Description |
|---|---|---|---|
| S1 | $NH_3$-N (mg/l) | Once/week | Above Outfall #1 |
| S1 | pH (units) | Once/week | Above Outfall #1 |
| S1 | Temp (C or F) | Once/week | Above Outfall #1 |
| S1 | Dissolved Oxygen (mg/l) | Once/week | Above Outfall #1 |
| S2 | $NH_3$-N (mg/l) | Once/week | ¼ Mi below Outfall #1 |
| S2 | pH (units) | Once/week | ¼ Mi below Outfall #1 |
| S2 | Temp (C or F) | Once/week | ¼ Mi below Outfall #1 |
| S2 | Dissolved Oxygen (mg/l) | Once/week | ¼ Mi below Outfall #1 |

## Derivation and Discussion of Limits

Biochemical Oxygen Demand: Outfall #1 - Normal limits of 30 and 45 may lead to violation of WQ standard for cold water fishery. A review of DMRs indicates that compliance with proposed limits should not be a problem for this facility.

Outfalls #2 & #3 – A violation of WQ standard for cold water fishery is possible if flowing at design capacity with 45 mg/l BOD under 7Q10 condition. However, these are storm water overflows, so such a situation would not be likely.

Total Suspended Solids: 10 CSR 20-7 (8)(B)1.

pH: 10 CSR 20-7 (8)(B)2.

Dilution factors = (Design flow + 7Q10)/Design flow; Chronic (1.934 + 3)/1.934 = 2.55; Acute (1.934 + [3/4])/1.934 = 1.39.

Ammonia: Data from Roubidoux Spring indicate pH values of up to 8.0. To cover the margin of error, cold water fishery chronic and acute criteria of pH 8.2 and 26$^{o}$C were applied. Chronic = 0.6 mg/l; Acute = 2.9 mg/l. $NH_3$-N decay rate = (0.125 mg/l)/0.25 mi.
Chronic: (0.6 + 0.125)*2.55 = 1.85 mg/l. Acute: (2.9 + 0.125)*1.39 = 4.2 mg/l (>1.85).

Total Residual Chlorine: Cold water criteria = 2ug/l = 0.002 mg/l. 0.002*2.55 = 0.0051 < detect limit.

Fecal coliform: 10 CSR 20-7.015(8)4A.

Reviewer: MO Date: 8/27/2001 Section Chief: JM